

In paragraph 4 of the last Office Action, the Examiner characterized claims 1-8 as method claims, and claims 9-18 as apparatus claims. To clarify matters, Applicants respectfully point out that this characterization is reversed: Claims 1-8 are drawn to an apparatus, and claims 9-18 are drawn to a method.

Applicants respectfully traverse all of the above rejections and beg for reconsideration in view of the remarks set out below.

In their remarks, below, Applicants will explain why independent apparatus claim 1 is non-obvious over the cited references. On the ground that claim 1 meets the standard for patentability of 35 U.S.C. 103, Applicants will argue that claims 2-8, as depending from claim 1, likewise meet the same standard. Applicants will then argue that because independent method claim 9 contains method limitations that correspond to the apparatus limitations of claim 1, claim 9 and its dependent claims 10-18 likewise meet the standard of 35 U.S.C. 103 for patentability over the cited references.

The invention of claim 1 is a telephonic handset. The handset comprises an active noise reduction (ANR) system which, importantly, is configured as a fixed feed-forward noise-cancellation system. The ANR system, as described in claim 1, comprises a non-adaptive, digital, IIR filter.

The Examiner has cited Kimura as disclosing a handset having fixed-forward noise cancellation. The Examiner has correctly recognized that Kimura discloses no use of a digital filter, much less a non-adaptive IIR filter, for noise cancellation.

The Examiner has cited the combination of Saunders and Chen as supplying the feature missing from Kimura; i.e., the non-adaptive IIR filter. More specifically, the Examiner has cited Saunders as disclosing an IIR filter in an adaptive personal active noise system, and has cited Chen as disclosing an IIR filter system which is non-adaptive.

However, Saunders teaches the use of feed-forward noise cancellation only in combination with a feedback system for noise cancellation. Saunders

states that this is necessary "for dealing with *inadequacies* of the adaptive feedforward algorithm . . . " [Italics added.] Saunders, column 4, lines 37-41.

The Saunders patent application was filed May 6, 1997. The priority of the Kimura patent application was based on a Japanese patent application filed May 25, 1989. Thus, even though almost eight years of progress in the noise-cancellation field took place between Kimura's and Saunders' patent filings, the Saunders applicants still believed that a feed-forward system alone does not do an adequate job of noise cancellation in a personal device.

In fact, the comment in Saunders about the inadequacy of feed-forward systems was made in reference to adaptive feed-forward noise cancellation. The adequacy of a fixed feed-forward system would be in even greater doubt.

Moreover, the Saunders system is not a handset. Instead, it is principally meant to be attached to an article of headgear, or otherwise to be worn on some part of the user's body. Saunders, column 4, lines 24-34. The positioning of the error microphones and loudspeakers can be adjusted to provide the best noise reduction. Saunders, column 7, lines 1-41. Thus, noise cancellation is abetted by the fact that once their positions have been adjusted, the microphones and loudspeakers are, to a large degree, fixed relative to the user's head. A handset, because it is handheld, does not offer the same degree of assurance that once the microphones and loudspeakers have been positioned, they will remain in their original positions relative to the user's head. Thus, once again, if the adequacy of a feed-forward system is in doubt for a head-based system, or other system meant to be worn, it can only be in still greater doubt for a handset system, which is meant to be held.

For the above reasons, Applicants submit that Saunders does not contain any suggestion that would lead the artisan of ordinary skill to include an IIR filter in the Kimura handset. If Saunders suggested anything at all in that regard, it would be to use an adaptive feedback system in the Kimura handset. Saunders clearly teaches away from using a pure feed-forward system for noise cancellation in a personal device.

The Examiner has cited Chen as disclosing a non-adaptive IIR filter. However, Chen teaches the use of the IIR filter only in combination with an adaptive FIR filter. Chen, column 2, line 64, to column 3, line 9. Thus, Chen actually teaches away from an ANR system that is purely a fixed feed-forward system.

It should also be noted that the technical field to which Chen pertains is not analogous to the field of the present invention. That is, the subject matter of Chen is an echo canceller in a telephone line. By contrast, the subject matter of the present invention is a handset that actively cancels ambient noise propagated through the atmosphere to the user's ear.

Applicants' claim 1 recites that "the ANR system [of the claimed handset] is configured as a fixed feed-forward noise-cancellation system." Applicants' claim 9 recites that the claimed ANR method comprises "processing the reference signal in a non-adaptive IIR filter, thereby to provide a cancellation signal" and "feeding the cancellation signal forward . . . substantially without feedback from [the receiver transducing] element." Thus, both of these claims are limited to the use of a purely fixed feed-forward ANR system. As explained above, Saunders teaches away from such a system. Therefore, even if, arguendo, Chen disclosed a use of an IIR filter similar to Applicants', there would still be no motivation to combine Saunders and Chen with Kimura to make the invention of Applicants' claim 1 or claim 9.

In fact, Chen is inapposite because it deals with the entirely separate technical problem of cancelling echo in telephone lines.

If Chen did have any bearing on the field of Applicants' invention, it would only be to teach away from the claimed invention, since the IIR filter of Chen is only a supplement to an adaptive FIR filter.

For the above reasons, Applicants submit that their independent claims 1 and 9 are both patentable over the cited references under the standard of 35 U.S.C. 103. Applicants submit further that through their dependency from claim 1 or claim 9, all of the other claims in the application are similarly patentable over

the cited references. Accordingly, withdrawal of the rejections, and allowance of all claims now pending, are respectfully solicited.

Respectfully,



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